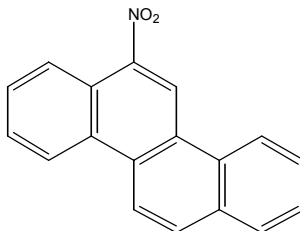


## NITROARENES (SELECTED)

### 6-NITROCHRYSENE

CAS No. 7496-02-8

First Listed in the *Eighth Report on Carcinogens*



## CARCINOGENICITY

6-Nitrochrysene is *reasonably anticipated to be a human carcinogen* based on sufficient evidence of carcinogenicity at multiple sites in multiple species of experimental animals (reviewed in IARC V.46, 1989). In seven studies, when administered by intraperitoneal injection, 6-nitrochrysene caused lung tumors in male and/or female mice (Busby et al., 1985, 1989; El-Bayoumy et al., 1992; Li et al., 1994; Fu et al., 1994; Imaida et al., 1992; Wislocki et al., 1986; cited by IARC V.46, 1989) and also induced liver tumors in female and/or male mice in three of these studies and malignant lymphoma in one. Dysplastic and/or adenomatous lesions of the colon were increased in male and female rats, and colon adenocarcinomas were increased in male rats receiving 6-nitrochrysene by intraperitoneal injection (Imaida et al., 1992). Mammary fibroadenoma, adenocarcinoma and spindle cell sarcomas were increased in female rats receiving 6-nitrochrysene by injection into the mammary gland (El-Bayoumy et al., 1993).

There are no data available to evaluate the carcinogenicity of 6-nitrochrysene in humans.

## ADDITIONAL INFORMATION RELEVANT TO CARCINOGENESIS OR POSSIBLE MECHANISMS OF CARCINOGENESIS

6-Nitrochrysene induced skin tumors, mainly papillomas, in a dermal initiation-promotion study in which 6-nitrochrysene was used as the initiator, followed by promotion with a phorbol ester (El-Bayoumy et al., 1982; cited by IARC V.46, 1989). 6-Nitrochrysene caused lung and forestomach tumors when given by intraperitoneal injection to transgenic mice carrying a human hybrid c-Ha-ras gene (Ogawa et al., 1996). 6-Nitrochrysene is genotoxic in several assays in bacteria and mammalian cells, induces cell transformation in finite lifespan cells in vitro and metabolic pathways leading to mutagenic and clastogenic metabolites and DNA adducts have been described (IARC V.46, 1989). Evidence for 6-nitrochrysene-DNA adducts in tumor target tissue supports further the possibility that tumors induced by this chemical are at least in part a result of chemical-induced DNA damage.

No data are available that would suggest that the mechanisms thought to account for tumor induction by 6-nitrochrysene in experimental animals would not also operate in humans.

## **PROPERTIES**

6-Nitrochrysene occurs as chrome-red, thick prismatic crystals; orange-yellow needles; and light-yellow needles. It can be transferred from a solid state to a vapor state without decomposition, and has a melting point of 209°C. 6-Nitrochrysene is slightly soluble in cold ethanol, diethyl ether, and carbon disulfide; slightly more soluble in benzene and acetic acid; and soluble in hot nitrobenzene. Heating 6-nitrochrysene with tin and concentrated hydrochloric acid in acetic acid at 100°C forms 6-aminochrysene. 6-Nitrochrysene also reacts with bromine to form 12-bromo-6-nitrochrysene, and it reacts with fuming nitric acid to form 6,12-dinitrochrysene. When heated to decomposition, 6-nitrochrysene emits toxic fumes of nitrogen oxides (NO<sub>x</sub>).

## **USE**

6-Nitrochrysene is used as an internal standard in the chemical analysis of nitroarenes. It is available for research purposes at ≥98% purity and is also available at a certified purity of 98.9% as a reference material. No evidence has been found that 6-nitrochrysene has been used commercially (IARC V.46, 1989).

## **PRODUCTION**

One American company produces 6-nitrochrysene (SRI, 1992), and Chem Sources identified one American supplier (Chem Sources, USA, 1992). No data on imports or exports of 6-nitrochrysene were available.

## **EXPOSURE**

The primary route of potential human exposure to 6-nitrochrysene is inhalation. Low concentrations of 6-nitrochrysene have been found in ambient airborne particulates. Prior to 1980, some carbon black samples known to be used in photocopy machines were found to contain considerable quantities of nitropyrenes. 6-Nitrochrysene is not listed in the National Occupational Exposure Survey or the National Occupational Hazard Survey conducted by NIOSH.

## **REGULATIONS**

OSHA regulates 6-nitrochrysene under the Hazard Communication Standard and as a chemical hazard in laboratories. Regulations are summarized in Volume II, Table B-93.